Amendment and Response under 37 C.F.R. 1.116
Applicant: Kenneth Kay Smith et al.
Serial No.: 10/790,360
Filed: March 1, 2004
Docket No.: 10014266-1
Title: SYSTEM FOR ERROR CORRECTION CODING AND DECODING

IN THE CLAIMS

Please cancel claims 11-12 and 14.

Please amend claims 1-4, 8, 10, 13, 15, 23, and 26 as follows:

1.   (Currently Amended) A<u>n error correction</u> system for ~~error correction~~ coding and decoding <u>at least one</u> information <u>block</u>, comprising:

first and second encoders each configured to encode the<u>at least one</u> information block, ~~wherein the second encoder has a higher capability than the first encoder and~~

wherein the first encoder generates first parity symbols <u>during encoding of the at least one information block,</u> and

wherein the second encoder generates second parity symbols <u>during encoding of the at least one information block,</u> with a <u>quantity</u>~~number~~ of the second parity symbols being greater than a <u>quantity</u>~~number~~ of the first parity symbols; and

first and second decoders configured to recover the<u>at least one</u> information <u>block,</u>

<u>wherein the first decoder and the second decoder are configured to operate sequentially in time with the first decoder acting first and the second decoder acting second,</u>

wherein the first decoder is configured to recover the<u>at least one</u> information block using the first parity symbols ~~generated when the first encoder encodes the information, and provide an indication if the information cannot be recovered~~, and

wherein the second decoder <u>is configured to</u> recover~~s~~ the<u>at least one</u> information <u>block</u> ~~encoded by the second encoder~~ <u>via the second parity symbols with the second decoder configured to remain inactive during operation of the first decoder and further remain inactive after operation of the first decoder unless~~only if~~the first decoder <u>is unsuccessful in attempting to</u> ~~cannot~~ recover the <u>at least one</u> information block and until the first decoder provides an indication to the second decoder to recover the at least one information block</u> ~~with the second decoder configured to recover the information using the second parity symbols generated when the second encoder encodes the information~~.

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2.   (Currently Amended) The system of claim 1, wherein the at least one information block is encoded to produce a codeword by combining the information, the first parity symbols, and the second parity symbols.

3.   (Currently Amended) The system of claim 2, comprising:

a multiplexer configured to combine the at least one information block, the first parity symbols and the second parity symbols into the codeword.

4.   (Currently Amended) The system of claim 13, wherein the at least one information block is encoded by combining the at least one information block, the first parity symbols, and the second parity symbols generated when the second encoder encodes both the at least one information block and the first parity symbols.

5-7.   (Canceled)

5
8.   (Currently Amended) The system of claim 4, wherein the second decoder is configured to recover the at least one information block by using second parity symbols generated when the second encoder encodes both the at least one information block and the first parity symbols.

9.   (Canceled)

6
10.   (Currently Amended) The system of claim 1, wherein the second decoder comprises:

a register configured to store the at least one information block and the second parity symbols; and

a processor system configured to recover the at least one information block by using second parity symbols only if the first decoder provides the indication.

11-12. (Canceled)

3

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13. (Currently Amended) A storage system having an error correction system for error correction coding and decoding at least one information block, comprising:

a first encoder and second encoders each configured to encode the at least one information block, wherein the first encoderusing applies first parity symbols;

a and the second encoder configured to encode the at least one information block by applyingies second parity symbols which are greater in number than the first parity symbols to enable locating and correcting a larger number of errors than the first encoder; and

a first decoder and second decoders configured to recover the at least one information block, wherein the first decoder acts first to recover the information ;and

athe second decoder configuredacts second to recover the at least one information block sequentially in time after operation of the first decoder, wherein encoded by the second encoder the second decoder initiates action to recover the at least information block only after completion by if the first decoder of an unsuccessful attempt cannot to recover the at least one information block, and further wherein the first and second encoders and the first and second decoders use an error correcting code;

wherein the first decoder and the second decoder are configured to recover the at least one information block via separating the at least one information block from the first parity symbols and the second parity symbols, respectively.

14. (Canceled)

15. (Currently Amended) The system of claim 14, wherein the first and second encoders and the first and second decoders the linear block code isuse a cyclic redundancy check code.

16. (Cancelled)

17. (Original) The system of claim 13, wherein the first and second encoders and the first and second decoders use a burst-correcting code.

18-22. (Canceled)

4

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10

23. (Currently Amended) A method of error correction coding and decoding information, comprising:

generating a number of first parity symbols from the information;

generating a number of second parity symbols from the information, wherein the number of the second parity symbols is greater than the number of the first parity symbols;

combining the first parity symbols, the second parity symbols and the information into an encoded data block;

recovering the information from the encoded data block, if no errors are present in the encoded data block, via disassembling the encoded data block by removing both the first parity symbols and the second parity symbols from the information;

recovering the information from the encoded data block, if an error is present in the encoded data block, by first using the first parity symbols if the information ean~is capable of beingbe~recovered using the first parity symbols; and

recovering the information from the encoded data block, after using the first parity symbols, by second using the second parity symbols only if recovery of the information was not accomplished cannot-be-recoveredby using the first parity symbols.

11   10

24. (Original) The method of claim 23, wherein generating a number of the second parity symbols from the information includes generating the number of the second parity symbols from both the first parity symbols and the information.

12   10

25. (Original) The method of claim 23, wherein recovering the information from the encoded data block using the first parity symbols includes detecting or correcting errors in the information which can be detected or corrected using the first parity symbols.

13   10

26. (Currently Amended) The method of claim 23, wherein recovering the information from the encoded data block using the second parity symbols includes detecting or correcting errors in the information which can be detected or corrected using the second parity symbols.

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14 27. (Original) The method of claim 23, wherein recovering the information from the encoded data block using the second parity symbols includes detecting or correcting errors in the first parity symbols and the information using the second parity symbols.